

# Multiple Intelligences: Beyond the Traditional IQ Score

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The theory of multiple intelligences was proposed by Howard Gardner in 1983 as a model of intelligence that differentiates intelligence into various specific (primarily sensory) modalities, rather than seeing it as dominated by a single general ability.

Gardner argues that there are a wide variety of cognitive abilities which are only very weakly correlated with one another, despite the close correlations between aspects of intelligence generally measured by traditional intelligence (IQ) tests or psychometrics. For example, the theory predicts that a child who learns to multiply easily is not necessarily generally more intelligent than a child who has more difficulty on this task. The child who takes more time to master simple multiplication 1) may best learn to multiply through a different approach, 2) may excel in a field outside of mathematics, or 3) may even be looking at and understand the multiplication process at a fundamentally deeper level. Such a fundamentally deeper understanding can result in what looks like slowness and can hide a mathematical intelligence potentially higher than that of a child who quickly memorizes the multiplication table despite a less detailed understanding of the process of multiplication.

The theory has been met with mixed responses. Empirical evidence reveals high correlations between different tasks (rather than the low correlations which Gardner's theory predicts). Nevertheless many educationalists support the practical value of the approaches suggested by the theory.

### **The multiple intelligences**

Gardner has articulated eight basic types of intelligence to date, without claiming that this is a complete list. Gardner's original list included seven of these; in 1999 he added a naturalist intelligence. He has also considered existential intelligence and moral intelligence, but does not find sufficient evidence for these based upon his articulated criteria, which include:

the potential for brain isolation by brain damage,  
its place in evolutionary history,  
the presence of core operations,  
susceptibility to encoding (symbolic expression),  
a distinct developmental progression,  
the existence of savants, prodigies and other exceptional people,  
support from experimental psychology and psychometric findings.

The theory's eight currently accepted intelligences are: (Ref: Educational Psychology, Robert Slavin. 2009, 117)

Spatial

Linguistic

Logical-mathematical

Bodily-kinesthetic

Musical

Interpersonal

Intrapersonal

Naturalistic

### **Spatial**

This area deals with spatial judgment and the ability to visualize with the mind's eye. Careers which suit those with this type of intelligence include artists, designers and architects. A spatial person is also good with puzzles.

### **Linguistic**

This area has to do with words, spoken or written. People with high verbal-linguistic intelligence display a facility with words and languages. They are typically good at reading, writing, telling stories and memorizing words along with dates. They tend to learn best by reading, taking notes, listening to lectures, and by discussing and debating about what they have learned. Those with verbal-linguistic intelligence learn foreign languages very easily as they have high verbal memory and recall, and an ability to understand and manipulate syntax and structure.

### **Logical-mathematical**

This area has to do with logic, abstractions, reasoning and numbers. While it is often assumed that those with this intelligence naturally excel in mathematics, chess, computer programming and other logical or numerical activities, a more accurate definition places less emphasis on traditional mathematical ability and more on reasoning capabilities, recognizing abstract patterns, scientific thinking and investigation and the ability to perform complex calculations. It correlates strongly with traditional concepts of "intelligence" or IQ.

### **Bodily-kinesthetic**

The core elements of the bodily-kinesthetic intelligence are control of one's bodily motions and the capacity to handle objects skillfully (206). Gardner elaborates to say that this intelligence also includes a sense of timing, a clear sense of the goal of a physical action, along with the ability to train responses so they become like reflexes.

In theory, people who have bodily-kinesthetic intelligence should learn better by involving muscular movement (e.g. getting up and moving around into the learning experience), and are generally

good at physical activities such as sports or dance. They may enjoy acting or performing, and in general they are good at building and making things. They often learn best by doing something physically, rather than by reading or hearing about it. Those with strong bodily-kinesthetic intelligence seem to use what might be termed muscle memory - they remember things through their body such as verbal memory.

Careers that suit those with this intelligence include: athletes, pilots, dancers, musicians, actors, surgeons, doctors, builders, police officers, and soldiers. Although these careers can be duplicated through virtual simulation, they will not produce the actual physical learning that is needed in this intelligence.

### **Musical**

This area has to do with sensitivity to sounds, rhythms, tones, and music. People with a high musical intelligence normally have good pitch and may even have absolute pitch, and are able to sing, play musical instruments, and compose music. Since there is a strong auditory component to this intelligence, those who are strongest in it may learn best via lecture. Language skills are typically highly developed in those whose base intelligence is musical. In addition, they will sometimes use songs or rhythms to learn. They have sensitivity to rhythm, pitch, meter, tone, melody or timbre. Careers that suit those with this intelligence include instrumentalists, singers, conductors, disc-jockeys, orators, writers and composers.

### **Interpersonal**

This area has to do with interaction with others. In theory, people who have a high interpersonal intelligence tend to be extroverts, characterized by their sensitivity to others' moods, feelings, temperaments and motivations, and their ability to cooperate in order to work as part of a group. They communicate effectively and empathize easily with others, and may be either leaders or followers. They typically learn best by working with others and often enjoy discussion and debate. Careers that suit those with this intelligence include sales, politicians, managers, teachers and social workers.

### **Intrapersonal**

This area has to do with introspective and self-reflective capacities. People with intrapersonal intelligence are intuitive and typically introverted. They are skillful at deciphering their own feelings and motivations. This refers to having a deep understanding of the self; what your strengths/weaknesses are, what makes you unique, you can predict your own reactions/ emotions. Careers which suit those with this intelligence include philosophers, psychologists, theologians, lawyers,

and writers. People with intrapersonal intelligence also prefer to work alone.

### **Naturalistic**

This area has to do with nurturing and relating information to one's natural surroundings. Careers which suit those with this intelligence include naturalists, farmers and gardeners.

### **Existential**

Some proponents of multiple intelligence theory proposed spiritual or religious intelligence as a possible additional type. Gardner did not want to commit to a spiritual intelligence, but suggested that an "existential" intelligence may be a useful construct. The hypothesis of an existential intelligence has been further explored by educational researchers.

Ability to contemplate phenomena or questions beyond sensory data, such as the infinite and infinitesimal. Careers or callings which suit those with this intelligence include shamans, priests, mathematicians, physicists, scientists, cosmologists and philosophers.

### **Use in education**

Traditionally, schools have emphasized the development of logical intelligence and linguistic intelligence (mainly reading and writing). IQ tests (given to about 1,000,000 students each year) focus mostly on logical and linguistic intelligence as well. While many students function well in this environment, there are those who do not. Gardner's theory argues that students will be better served by a broader vision of education, wherein teachers use different methodologies, exercises and activities to reach all students, not just those who excel at linguistic and logical intelligence.

Many teachers see the theory as simple common sense. Some say that it validates what they already know: that students learn in different ways. On the other hand, James Traub's article in *The New Republic* notes that Gardner's system has not been accepted by most academics in intelligence or teaching.

George Miller, the esteemed psychologist credited with discovering the mechanisms by which short term memory operates, wrote in *The New York Times Book Review* that Gardner's argument boiled down to "hunch and opinion" (p. 20). Gardner's subsequent work has done very little to shift the balance of opinion. A recent issue of *Psychology, Public Policy, and Law* devoted to the study of intelligence contained virtually no reference to Gardner's work. Most people who study intelligence view M.I. theory as rhetoric rather than science, and they are divided on the virtues of the rhetoric.

The application of the theory of multiple intelligences varies widely. It runs the gamut from a teacher who, when confronted with a student having difficulties, uses a different approach to teach the material, to an entire school using MI as a framework. In general, those who subscribe to the theory strive to provide opportunities for their students to use and develop all the different intelligences, not just the few at which they naturally excel.

A Harvard-led study of 41 schools using the theory came to the conclusion that in these schools there was "a culture of hard work, respect, and caring; a faculty that collaborated and learned from each other; classrooms that engaged students through constrained but meaningful choices, and a sharp focus on enabling students to produce high-quality work."

Of the schools implementing Gardner's theory, the most well-known is New City School, in St. Louis, Missouri, which has been using the theory since 1988. The school's teachers have produced two books for teachers, *Celebrating Multiple Intelligences* and *Succeeding With Multiple Intelligences* and the principal, Thomas Hoerr, has written *Becoming a Multiple Intelligences School* as well as many articles on the practical applications of the theory. The school has also hosted four conferences, each attracting over 200 educators from around the world and remains a valuable resource for teachers interested in implementing the theory in their own classrooms. Thomas Armstrong argues that Waldorf education organically engages all of Gardner's original seven intelligences.

## **Critical reception**

### **The definition of intelligence**

One major criticism of the theory is that it is ad hoc: that Gardner is not expanding the definition of the word "intelligence"; rather, he denies the existence of intelligence as traditionally understood and instead uses the word "intelligence" whenever other people have traditionally used words like "ability". This practice has been criticized by Robert J. Sternberg (1983, 1991), Eysenck (1994), and Scarr (1985)

Defenders of MI theory argue that the traditional definition of intelligence is too narrow, and thus broader definition more accurately reflects the differing ways in which humans think and learn. They would state that the traditional interpretation of intelligence collapses under the weight of its own logic and definition, noting that intelligence is usually defined as the cognitive or mental capacity of an individual, which by logical necessity would include all forms of mental qualities, not simply the ones most transparent to standardized I.Q. tests.

Some of these criticisms arise from the fact that Gardner has not provided a test of his multiple intelligences. He originally defined it as the ability to solve problems that have value in at least one culture, or as something that a student is interested in. However, he added a disclaimer that he has

no fixed definition, and his classification is more of an artistic judgment than fact:

Ultimately, it would certainly be desirable to have an algorithm for the selection of an intelligence, such that any trained researcher could determine whether a candidate's intelligence met the appropriate criteria. At present, however, it must be admitted that the selection (or rejection) of a candidate's intelligence is reminiscent more of an artistic judgment than of a scientific assessment. (Gardner, *Frames of Mind: The Theory of Multiple Intelligences*, 1985)

Gardner argues that by calling linguistic and logical-mathematical abilities intelligences, but not artistic, musical, athletic, etc. abilities, the former are needlessly aggrandized. Certain critics balk at this widening of the definition, saying that it ignores "the connotation of intelligence... has always connoted the kind of thinking skills that makes one successful in school."

Gardner writes "I balk at the unwarranted assumption that certain human abilities can be arbitrarily singled out as intelligence while others cannot" Critics hold that given this statement, any interest or ability is now redefined as "intelligence". Thus, by adopting this theory, studying intelligence becomes difficult, because it diffuses into the broader concept of ability or talent. Gardner's addition of the naturalistic intelligence and conceptions of the existential and moral intelligences are seen as fruits of this diffusion. Defenders of the MI theory would argue that this is simply a recognition of the broad scope of inherent mental abilities, and that such an exhaustive scope by nature defies a simple, one-dimensional classification such as an assigned IQ value.

### **Tautology**

The theory and definitions have been critiqued by Perry D. Klein as being so unclear as to be tautologous and thus unfalsifiable. Having a high musical ability means being good at music while at the same time being good at music is explained by having a high musical ability.

### **Neo-Piagetian criticism**

Andreas Demetriou suggests that theories which overemphasize the autonomy of the domains are as simplistic as the theories that overemphasize the role of general intelligence and ignore the domains. He agrees with Gardner that there indeed are domains of intelligence that are relevantly autonomous of each other. In fact, some of the domains, such as verbal, spatial, mathematical, and social intelligence are identified by most lines of research in psychology. However, in his theory, one of the neo-Piagetian theories of cognitive development, Gardner is criticized for underestimating the effects exerted on the various domains of intelligences by processes that define general processing efficiency, such as speed of processing, executive functions, and working memory, and meta-cognitive processes underlying self-awareness and self-regulation. All of these processes are integral components of general intelligence that regulate the functioning

and development of different domains of intelligence.

Thus, it is argued that the domains are to a large extent expressions of the condition of the general processes. At the same time, the domains may vary because of their constitutional differences but also differences in individual preferences and inclinations. Moreover, their functioning both channels and influences the operation of the general processes. Thus, one cannot satisfactorily specify the intelligence of an individual or design effective interventions programs unless both the general processes and the domains of interest are evaluated (Demetriou & Kazi, 2006; Demetriou, Mouyi, & Spanoudis, 2010).

### **Spatial intelligence**

Gardner argues that IQ tests only measures linguistic and logical-mathematical abilities. Psychologist Alan S. Kaufman argues that IQ tests have measured spatial abilities for 70 years.

### **Modern IQ tests measure many abilities**

Modern IQ tests are greatly influenced by the Cattell-Horn-Carroll theory which incorporates a general intelligence but also many more narrow abilities. While IQ tests do give an overall IQ score, they now also give scores for many more narrow abilities.

### **Lack of empirical evidence**

According to a 2006 study many of Gardner's "intelligences" actually correlate with the g factor, supporting the idea of a single dominant type of intelligence. According to the study, each of the domains proposed by Gardner involved a blend of g, of cognitive abilities other than g, and, in some cases, of non-cognitive abilities or of personality characteristics.

Linda S. Gottfredson (2006) has argued that the results of thousands of studies support the importance of IQ for school and job performance. IQ also predicts or correlates with numerous other life outcomes. In contrast, empirical support for non-g intelligences is lacking or very poor. She argued that despite this the ideas of multiple non-g intelligences are very attractive to many due to the suggestion that everyone can be smart in some way.

A critical review of MI theory argues that there is little empirical evidence to support it:

"To date there have been no published studies that offer evidence of the validity of the multiple intelligences. In 1994 Sternberg reported finding no empirical studies. In 2000 Allix reported finding no empirical validating studies, and at that time Gardner and Connell conceded that there was "little hard evidence for MI theory" (2000, p. 292). In 2004 Sternberg and Grigorenko stated that

there were no validating studies for multiple intelligences, and in 2004 Gardner asserted that he would be "delighted were such evidence to accrue" (p. 214), and he admitted that "MI theory has few enthusiasts among psychometricians or others of a traditional psychological background" because they require "psychometric or experimental evidence that allows one to prove the existence of the several intelligences" (2004, p. 214)." (Waterhouse, 2006a, p. 208).

The same review presents evidence to demonstrate that cognitive neuroscience research does not support the theory of Multiple Intelligences:

"the human brain is unlikely to function via Gardner's multiple intelligences. Taken together the evidence for the intercorrelations of subskills of IQ measures, the evidence for a shared set of genes associated with mathematics, reading, and g, and the evidence for shared and overlapping "what is it? and "where is it? neural processing pathways, and shared neural pathways for language, music, motor skills, and emotions suggest that it is unlikely that each of Gardner's intelligences could operate "via a different set of neural mechanisms" (1999, p. 99). Equally important, the evidence for the "what is it? and "where is it? processing pathways, for Kahneman's two decision-making systems, and for adapted cognition modules suggests that these cognitive brain specializations have evolved to address very specific problems in our environment. Because Gardner claimed that the intelligences are innate potentialities related to a general content area, MI theory lacks a rationale for the phylogenetic emergence of the intelligences." (From Waterhouse, 2006a, p. 213).

A number of articles have surveyed the use of Gardner's ideas and conclude that there is little to no academically substantiated evidence that his ideas work in practice. Steven A. Stahl found that most of the previous studies which claimed to show positive results had major flaws:

Among others, Marie Carbo claims that her learning styles work is based on research. {I discuss Carbo because she publishes extensively on her model and is very prominent in the workshop circuit...} But given the overwhelmingly negative findings in the published research, I wondered what she was citing, and about a decade ago, I thought it would be interesting to take a look. Reviewing her articles, I found that out of 17 studies she had cited, only one was published. Fifteen were doctoral dissertations and 13 of these came out of one university--St. John's University in New York, Carbo's alma mater. None of these had been in a peer-refereed journal. When I looked closely at the dissertations and other materials, I found that 13 of the 17 studies that supposedly support her claim had to do with learning styles based on something other than modality.

To date, the current No Child Left Behind high-stakes test legislation in the United States does not encompass the multiple intelligences framework in the exams' design and/or implementation.